

**U.S.ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY
540 S. MORRIS AVE., MONTGOMERY, AL 36115
TH ANALYSES**

REPORT OF SAMPLE DELIVERY GROUP #1600015

Project: Canadian Radium & Uranium, Mt. Kisco, NY
 Analysis method: Isotopic Thorium Using NaOH Fusion
 Report ID: 1600015-TH
 Report type: Original
 Date reported: 06/16/2016
 Total pages in report: 32

SAMPLES

NAREL Sample #	Client Sample ID	Location	Matrix	Date Collected	Date Received
B6.04104Y	C2-SB1-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04105Z	C2-SB1-4860-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04106A	C2-SB1-6072-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04107B	C2-SB1-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04108C	C2-SB1-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04109D	C2-SB2-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04110W	C2-SB2-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04111X	C2-SB2-2436-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04112Y	C2-SB2-3648-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04113Z	C2-SB2-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04114A	C2-SB2-7284-02	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04115B	C2-SB2-8496-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04116C	C2-SB3-0012-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04117D	C2-SB3-1224-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04118E	C2-SB3-4860-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04119F	C2-SB3-6072-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016
B6.04120Y	C2-SB3-7284-01	NY:MT. KISCO	SOIL	04/06/2016	04/19/2016

EXCEPTIONS

- Packaging and shipping** – No problems were observed.
- Documentation** – No problems were observed.
- Sample preparation** – No problems were encountered.
- Analysis** – Samples B6.04104 through B6.04112 were reanalyzed as a result of a Th-228 duplicate failure during the original analysis. The results of the reanalyses are reported in this data package. During the reanalysis of those samples, sample B6.04104 has a yield that was below NAREL's lower acceptance criterion. The QA officer for the center determined that it met the uncertainty requirement and approved the analysis.
- Holding times** – No holding times were specified.

QUALITY CONTROL

1. QC samples – All QC analysis results met NAREL acceptance criteria.
2. Yields – All chemical yields were within acceptance limits except the yield for sample B6.04104 which has a yield that was below NAREL's lower acceptance criterion. The QA officer for the center determined that it met the uncertainty requirement that the relative standard uncertainty of the measured yield does not exceed 7.5 % and approved the analysis.
3. Instruments – Response and background checks for all instruments used in these analyses met NAREL acceptance criteria.

ACCREDITATION



All analyses included in this data package are accredited by the Oregon Environmental Laboratory Accreditation Program (ORELAP) to the TNI standard.

CERTIFICATION

I certify that this data report complies with the terms and conditions of the Project Acceptance Form and/or the Quality Assurance Project Plan, except as noted above. Release of the data contained in this report has been authorized by the Director of the Center for Environmental Radioanalytical Laboratory Science and the NAREL Quality Assurance Manager, or their designees, as verified by the following signatures.

Velinda Herbert

Velinda Herbert
Quality Assurance Manager, NAREL

4/22/16

Date

Cynthia White

Cynthia White
Director, Center for Environmental Radioanalytical
Laboratory Science

6-22-16

Date

GENERAL INFORMATION

SAMPLE TYPES

BLD	Blind sample
FBK	Field blank
SAM	Normal sample

ANALYSIS QC TYPES

ANA	Normal analysis
DUP	Laboratory duplicate
LCS	Laboratory control sample, or blank spike
MS	Matrix spike
MSD	Matrix spike duplicate (not currently analyzed)
RBK	Method blank
STD	External standard (used for ^{228}Ra yield determination)

QUALITY INDICATORS

RPD	Relative Percent Difference
%R	Percent Recovery
Z	Number of standard deviations by which a QC measurement differs from the expected value

RADIOCHEMICAL DATA

Radiochemical analyses usually require the subtraction of an instrument background measurement result from a gross sample measurement result. Both values are positive, but when the sample activity is low, random variations in the two measurements can cause the gross value to be less than the background, resulting in a measured activity less than zero. Although negative activities have no physical significance, they do have statistical importance, as for example in the evaluation of trends or the comparison of two groups of samples.

To the extent practical, it is the policy of NAREL to report results as generated, whether positive, negative, or zero, together with the "2-sigma" measurement uncertainty and a sample-specific estimate of the minimum detectable concentration (MDC). The measurement result, uncertainty, and MDC are always expressed in the same unit of measurement.

EVALUATION OF QC ANALYSES

A method blank result is considered unacceptable if it is more than 3 standard deviations below zero or more than 3 standard deviations above a predetermined upper control limit. For some analyses NAREL has set the upper control limit at zero. For others the control limit is a small positive number.

NAREL evaluates the results of duplicate and spike analyses using "Z scores." A Z score is the number of standard deviations by which the QC result differs from its ideal value. Generally the score is considered acceptable if its absolute value is not greater than 3.

The Z score for a spiked sample is computed by dividing the difference between the measured value and the target value by the combined standard uncertainty of the difference. The Z score for a duplicate analysis is computed by dividing the difference between the two measured values by the combined standard uncertainty of the difference.

NAREL reports the "relative percent difference," or RPD, between duplicate results and the "percent recovery," or %R, for spiked analyses, but does not use these values for evaluation of most analyses. An exception is the use of %R in the evaluation of gross alpha matrix spike results. A gross alpha matrix spike result is considered acceptable if either $|Z| \leq 3$ or $60 \leq \%R \leq 110$.

USEPA
Date Shipped: 4/18/2016
Carrier Name: FedEx
Alt/Unit#C: 8022 3372 1333

CHAIN OF CUSTODY RECORD
Canadian Radiation & Uranium Corp/AY
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

4/20/16
From Under #4

No: 2-041816-105138-0008
Lab: NAREL
Lab Contact: Tonya Hudson
Lab Phone: (343) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab O/C	Numb Cont	Container
5	CC02-SB001-00112-01 ✓	4/6/2016	13:56 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-0012-01 ✓	4/6/2016	13:56 ✓	Isotopic Uranium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-0012-01 ✓	4/6/2016	13:56 ✓	Gamma Spec. (Modified) ✓	Soil ✓	4C	N	1	16 oz glass jar ✓
5	CC02-SB001-4860-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
6	CC02-SB001-4860-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-4860-01 ✓	4/6/2016	13:57 ✓	Gamma Spec. (Modified) ✓	Soil ✓	4C	N	1	16 oz glass jar ✓
3	CC02-SB001-6072-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
3	CC02-SB001-6072-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-6072-01 ✓	4/6/2016	13:57 ✓	Gamma Spec. (Modified) ✓	Soil ✓	4C	N	1	16 oz glass jar ✓
5	CC02-SB001-7284-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-7284-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-7294-01 ✓	4/6/2016	13:57 ✓	Gamma Spec. (Modified) ✓	Soil ✓	4C	N	1	16 oz glass jar ✓
3	CC02-SB001-8496-01 ✓	4/6/2016	13:57 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
3	CC02-SB001-8496-01 ✓	4/6/2016	13:57 ✓	Isotopic Uranium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓
5	CC02-SB001-8496-01 ✓	4/6/2016	13:57 ✓	Gamma Spec. (Modified) ✓	Soil ✓	4C	N	1	16 oz glass jar ✓
5	CC02-SB002-0012-01	4/6/2016	14:31 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar
5	CC02-SB002-0012-01	4/6/2016	14:31 ✓	Subtopic Uranium ✓	Soil ✓	4C	N	1	8 oz glass jar
5	CC02-SB002-0012-01	4/6/2016	14:31 ✓	Gamma Spec. (Modified) ✓	Soil ✓	4C	N	1	16 oz glass jar
4	CC02-SB002-1224-01 ✓	4/6/2016	14:31 ✓	Isotopic Thorium ✓	Soil ✓	4C	N	1	8 oz glass jar ✓

Samples Transferred From: Ra-226 (In-growth), Ra-228, K-40, Th-232, Ba-212, Pb-214, Pb-212, Ra-228, Ra-228, Th-234, U-235, Pb-210, Bi-210. Email results to s.m.surnby@westonsolutions.com and ben.nwosu@westonsolutions.com.

Item/Reason	Received by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	<i>Bernard Nwosu RST</i>		<i>John MAREL</i>		<i>off white Good</i>

CHAIN OF CUSTODY RECORD
 Canadian Radium & Uranium Corp/NY
 Contact Name: Bernard Nwosu
 Contact Phone: (908) 565-2980

No: 2-041816-105138-0008
 Lab: NAREL
 Lab Contact: Tonya Hudson
 Lab Phone: (943) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Numb Cont	Container
1	C002-SB002-4224-01 ✓	4/6/2016	14:31	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-1224-01 ✓	4/6/2016	14:31	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
1	C002-SB002-2438-01 ✓	4/6/2016	14:32	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-2436-01 ✓	4/6/2016	14:32	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-2436-01 ✓	4/6/2016	14:32	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
1	C002-SB002-3648-01 ✓	4/6/2016	14:32	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-3648-01 ✓	4/6/2016	14:32	Isotopic Uranium ✓	Soil	4 C	N	1	16 oz glass jar ✓
1	C002-SB002-3648-01 ✓	4/6/2016	14:32	Gamma Spec (Modified) ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-7284-01 ✓	4/6/2016	14:33	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-7284-01 ✓	4/6/2016	14:33	Isotopic Uranium ✓	Soil	4 C	N	1	16 oz glass jar ✓
1	C002-SB002-7284-01 ✓	4/6/2016	14:33	Gamma Spec (Modified) ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-7284-02 ✓	4/6/2016	14:33	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
1	C002-SB002-7284-02 ✓	4/6/2016	14:33	Isotopic Uranium ✓	Soil	4 C	N	1	16 oz glass jar ✓
1	C002-SB002-7284-02 ✓	4/6/2016	14:33	Gamma Spec (Modified) ✓	Soil	4 C	N	1	8 oz glass jar ✓
2	C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Isotopic Thorium ✓	Soil	4 C	✓	2	8 oz glass jar ✓
2	C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Isotopic Uranium ✓	Soil	4 C	✓	2	8 oz glass jar ✓
2	C002-SB002-8496-01 ✓	4/6/2016	14:33 ✓	Gamma Spec (Modified) ✓	Soil	4 C	✓	1	16 oz glass jar ✓
2	C002-SB003-2012-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
2	C002-SB003-2012-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar

SAMPLES TRANSFERRED FROM:
 CHAIN OF CUSTODY #

Item/Reason	Published by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Sample Condition Upon Receipt
	<i>Bernard Nwosu RSN</i>		<i>John Nwosu</i>	07/19/2016	Crushed

Special Instructions: Sample Analysis POI-009198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (In-growth), Ra-228, K-40, Th-230, Ba-212, Pb-214, Ra-226, Ra-210, Bi-210. Email results to s.sumaly@westonsolutions.com and ben.nwosu@westonsolutions.com

USEPA
Date Shipped: 4/18/2016
Carrier Name: FedEx
Airbill No: 8022 3572 1333

CHAIN OF CUSTODY RECORD
Canadian Radium & Uranium Company
Contact Name: Bernard Nwosu
Contact Phone: (908) 565-2980

No: 2-041816-105138-0008

Lab: NAERL
Lab Contact: Tonya Hudson
Lab Phone: (243) 270-3433

Lab #	Sample #	Sample Date	Sample Time	Analyses	Matrix	Preservative	Lab QC	Container	Numb Cont
	C002-SB003-0012-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-1224-01	4/6/2016	13:17	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-4860-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C002-SB003-6072-01	4/6/2016	13:18	Gamma Spec (Modified)	Soil	4 C	N	1	16 oz glass jar
	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C002-SB003-7284-01 ✓	4/6/2016	13:18	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C002-SB003-7284-01 ✓	4/6/2016	13:18	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Thorium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C002-SB003-8496-01 ✓	4/6/2016	13:19	Isotopic Uranium ✓	Soil	4 C	N	1	8 oz glass jar ✓
	C002-SB003-8496-01 ✓	4/6/2016	13:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Thorium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01	4/5/2016	12:19	Isotopic Uranium	Soil	4 C	N	1	8 oz glass jar
	C003-SB001-0012-01 ✓	4/5/2016	12:19	Gamma Spec (Modified) ✓	Soil	4 C	N	1	16 oz glass jar ✓

Special Instructions: Sample Analysis PO#-0081198: Gamma Spectroscopy analysis for soil samples to include: Ra-226 (Ra-226 is Ra-228, K-40, Th-232, Pb-212, Bi-218, Ra-214, Ra-226, Ra-228, Th-234, U-235, Pb-210, Sr-87). Email results to s.sumitalay@westonsolutions.com and ben.nwosu@westonsolutions.com

SAMPLES TRANSFERRED FROM:
CHAIN OF CUSTODY #:

Item/Reason	Relinquished by (Signature and Organization)	Date/Time	Received by (Signature and Organization)	Date/Time	Condition Upon Receipt
	Bernard Nwosu RST3	4/18/2016 10:15 AM	Atchafu Nwosu	4/18/2016 10:15 AM	Good Condition

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

SDG #1600015

ANALYSIS SUMMARY

Analysis method: NAREL ACT-02F-TH
 Title: Isotopic Thorium Using NaOH Fusion

NAREL Sample #	Client Sample ID	QC Type	Date Completed	Preparation Batch #	Assay Batch #
B6.04104Y	C2-SB1-0012-01		06/11/2016	0013447N	0020924Z
B6.04104Y	C2-SB1-0012-01	DUP	06/11/2016	0013447N	0020924Z
B6.04105Z	C2-SB1-4860-01		06/11/2016	0013447N	0020924Z
B6.04106A	C2-SB1-6072-01		06/11/2016	0013447N	0020924Z
B6.04107B	C2-SB1-7284-01		06/11/2016	0013447N	0020924Z
B6.04108C	C2-SB1-8496-01		06/11/2016	0013447N	0020924Z
B6.04109D	C2-SB2-0012-01		06/11/2016	0013447N	0020924Z
B6.04110W	C2-SB2-1224-01		06/11/2016	0013447N	0020924Z
B6.04111X	C2-SB2-2436-01		06/11/2016	0013447N	0020924Z
B6.04112Y	C2-SB2-3648-01		06/11/2016	0013447N	0020924Z
B6.04113Z	C2-SB2-7284-01		06/08/2016	0013438M	0020914X
B6.04113Z	C2-SB2-7284-01	DUP	06/08/2016	0013438M	0020914X
B6.04114A	C2-SB2-7284-02		06/08/2016	0013438M	0020914X
B6.04115B	C2-SB2-8496-01		06/08/2016	0013438M	0020914X
B6.04116C	C2-SB3-0012-01		06/08/2016	0013438M	0020914X
B6.04117D	C2-SB3-1224-01		06/08/2016	0013438M	0020914X
B6.04118E	C2-SB3-4860-01		06/08/2016	0013438M	0020914X
B6.04119F	C2-SB3-6072-01		06/08/2016	0013438M	0020914X
B6.04120Y	C2-SB3-7284-01		06/08/2016	0013438M	0020914X
LCS-00735295Q *		LCS	06/08/2016	0013438M	0020914X
RBK-00735294P *		RBK	06/08/2016	0013438M	0020914X
LCS-00735406D *		LCS	06/11/2016	0013447N	0020924Z
RBK-00735405C *		RBK	06/11/2016	0013447N	0020924Z

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04104Y	Amount analyzed:	1.094e+00 GASH
Client sample ID:	C2-SB1-0012-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:56 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.75 %	Analyst:	SPK
Ash/dry weight:	88.99 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS97	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	8.10e-02	7.1e-02	7.5e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.97e-01	1.6e-01	5.2e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	4.48e-01	1.3e-01	7.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	4.50e-01	1.3e-01	4.2e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04104Y	Amount analyzed:	9.600e-01 GASH
Client sample ID:	C2-SB1-0012-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:56 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.75 %	Analyst:	SPK
Ash/dry weight:	88.99 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS98	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.04e-01	4.9e-02	2.5e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	4.68e-01	8.6e-02	2.3e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	4.74e-01	9.1e-02	5.4e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	5.12e-01	9.1e-02	1.9e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04105Z	Amount analyzed:	9.818e-01 GASH
Client sample ID:	C2-SB1-4860-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	94.41 %	Analyst:	SPK
Ash/dry weight:	97.26 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS99	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	6.71e-02	4.1e-02	2.8e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.04e-01	9.4e-02	1.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	4.84e-01	9.7e-02	5.8e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	5.18e-01	9.6e-02	1.6e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04106A	Amount analyzed:	9.944e-01 GASH
Client sample ID:	C2-SB1-6072-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	91.38 %	Analyst:	SPK
Ash/dry weight:	98.14 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS100	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	7.06e-02	4.5e-02	3.7e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	6.30e-01	1.1e-01	2.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	5.03e-01	1.0e-01	6.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	5.89e-01	1.1e-01	2.4e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04107B	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C2-SB1-7284-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.06 %	Analyst:	SPK
Ash/dry weight:	94.96 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS101	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227 J	1.23e-01	5.6e-02	3.3e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	7.50e-01	1.2e-01	2.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	6.18e-01	1.1e-01	5.6e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	7.09e-01	1.2e-01	1.5e-02	PCI/GDRY	06/10/2016 15:38 CDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04108C	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C2-SB1-8496-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 13:57 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	81.74 %	Analyst:	SPK
Ash/dry weight:	96.75 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS103	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	9.79e-02	4.8e-02	2.6e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	7.43e-01	1.2e-01	2.5e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	5.42e-01	1.0e-01	5.7e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	7.11e-01	1.1e-01	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04109D	Amount analyzed:	9.756e-01 GASH
Client sample ID:	C2-SB2-0012-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:31 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	95.55 %	Analyst:	SPK
Ash/dry weight:	85.26 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS104	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.15e-01	6.1e-02	4.3e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.37e-01	1.1e-01	4.1e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	5.54e-01	1.2e-01	5.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	4.17e-01	9.3e-02	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04110W	Amount analyzed:	1.016e+00 GASH
Client sample ID:	C2-SB2-1224-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:31 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	83.51 %	Analyst:	SPK
Ash/dry weight:	89.80 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS105	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.25e-01	5.3e-02	2.4e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	9.90e-01	1.4e-01	1.7e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	1.08e+00	1.5e-01	5.2e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	8.48e-01	1.3e-01	1.7e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04111X	Amount analyzed:	9.908e-01 GASH
Client sample ID:	C2-SB2-2436-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:32 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	89.06 %	Analyst:	SPK
Ash/dry weight:	97.20 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS106	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227 J	1.13e-01	5.4e-02	2.8e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	5.62e-01	1.0e-01	2.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	9.32e-01	1.5e-01	5.9e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	6.17e-01	1.1e-01	2.2e-02	PCI/GDRY	06/10/2016 15:38 CDT

Note: A "J" qualifier indicates a result that may be significantly under or overestimated.

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04112Y	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C2-SB2-3648-01	Preparation batch #:	0013447N
Matrix:	SOIL	Assay batch #:	0020924Z
Collected:	2016-04-06 14:32 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	90.76 %	Analyst:	SPK
Ash/dry weight:	91.79 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS107	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.38e-01	5.8e-02	3.2e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th228	8.93e-01	1.3e-01	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th230	1.57e+00	2.1e-01	5.4e-02	PCI/GDRY	06/10/2016 15:38 CDT
Th232	7.59e-01	1.2e-01	2.0e-02	PCI/GDRY	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04113Z	Amount analyzed:	1.001e+00 GASH
Client sample ID:	C2-SB2-7284-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	84.35 %	Analyst:	SPK
Ash/dry weight:	95.90 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS97	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	8.11e-02	4.8e-02	3.7e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	1.11e+00	1.7e-01	2.5e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	6.80e-01	1.2e-01	5.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	1.01e+00	1.6e-01	2.1e-02	PCI/GDRY	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04113Z	Amount analyzed:	9.982e-01 GASH
Client sample ID:	C2-SB2-7284-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	84.35 %	Analyst:	SPK
Ash/dry weight:	95.90 %	QC type:	DUP
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS98	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.05e-01	5.2e-02	2.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	9.55e-01	1.4e-01	2.5e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	7.38e-01	1.2e-01	5.7e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	8.72e-01	1.4e-01	2.2e-02	PCI/GDRY	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04114A	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C2-SB2-7284-02	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	83.99 %	Analyst:	SPK
Ash/dry weight:	95.93 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:22	1000.0	AS99	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.47e-01	6.2e-02	2.8e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th228	1.09e+00	1.6e-01	2.0e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th230	6.44e-01	1.2e-01	5.7e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th232	1.12e+00	1.6e-01	1.6e-02	PCI/GDRY	06/07/2016 16:22 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04115B	Amount analyzed:	1.011e+00 GASH
Client sample ID:	C2-SB2-8496-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 14:33 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	80.48 %	Analyst:	SPK
Ash/dry weight:	96.73 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:22	1000.0	AS100	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.00e-01	5.0e-02	3.3e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th228	7.64e-01	1.2e-01	2.6e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th230	6.07e-01	1.1e-01	5.7e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th232	7.36e-01	1.2e-01	2.1e-02	PCI/GDRY	06/07/2016 16:22 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04116C	Amount analyzed:	1.003e+00 GASH
Client sample ID:	C2-SB3-0012-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:17 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	78.00 %	Analyst:	SPK
Ash/dry weight:	92.46 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:22	1000.0	AS102	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.20e-01	5.4e-02	3.3e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th228	3.73e+00	4.2e-01	2.9e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th230	1.08e+00	1.6e-01	5.7e-02	PCI/GDRY	06/07/2016 16:22 CDT
Th232	3.83e+00	4.3e-01	1.8e-02	PCI/GDRY	06/07/2016 16:22 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04117D	Amount analyzed:	1.005e+00 GASH
Client sample ID:	C2-SB3-1224-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:17 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	86.91 %	Analyst:	SPK
Ash/dry weight:	96.78 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS103	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.06e-01	5.2e-02	2.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	7.49e-01	1.2e-01	2.7e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	1.00e+00	1.5e-01	5.9e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	8.81e-01	1.4e-01	2.2e-02	PCI/GDRY	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04118E	Amount analyzed:	9.998e-01 GASH
Client sample ID:	C2-SB3-4860-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	79.16 %	Analyst:	SPK
Ash/dry weight:	86.50 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS104	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.50e-01	6.0e-02	3.1e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	8.47e-01	1.3e-01	3.0e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	1.32e+00	1.8e-01	5.2e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	7.67e-01	1.2e-01	1.4e-02	PCI/GDRY	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04119F	Amount analyzed:	1.003e+00 GASH
Client sample ID:	C2-SB3-6072-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	60.06 %	Analyst:	SPK
Ash/dry weight:	87.01 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS121	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	8.66e-02	4.2e-02	2.3e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	8.65e-01	1.3e-01	1.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	7.20e-01	1.1e-01	5.0e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	9.44e-01	1.3e-01	1.3e-02	PCI/GDRY	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	B6.04120Y	Amount analyzed:	1.009e+00 GASH
Client sample ID:	C2-SB3-7284-01	Preparation batch #:	0013438M
Matrix:	SOIL	Assay batch #:	0020914X
Collected:	2016-04-06 13:18 EDT	Prep procedure:	N/A
Sample type:	SAM	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	83.07 %	Analyst:	SPK
Ash/dry weight:	98.05 %	QC type:	ANA
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS122	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.56e-01	6.1e-02	2.6e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th228	8.15e-01	1.3e-01	2.8e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th230	7.35e-01	1.2e-01	5.6e-02	PCI/GDRY	06/07/2016 16:23 CDT
Th232	7.30e-01	1.2e-01	1.8e-02	PCI/GDRY	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	LCS-00735295Q	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013438M
Matrix:	N/A	Assay batch #:	0020914X
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS123	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	6.40e-02	4.6e-02	4.8e-02	PCI	06/07/2016 16:23 CDT
Th228	1.20e-02	1.9e-02	3.1e-02	PCI	06/07/2016 16:23 CDT
Th230	1.90e+00	2.4e-01	6.2e-02	PCI	06/07/2016 16:23 CDT
Th232	6.02e-03	1.5e-02	2.9e-02	PCI	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	RBK-00735294P	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013438M
Matrix:	N/A	Assay batch #:	0020914X
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/07/2016 16:23	1000.0	AS124	CEB

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2\sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	1.06e-02	2.3e-02	3.9e-02	PCI	06/07/2016 16:23 CDT
Th228	1.80e-02	2.0e-02	2.7e-02	PCI	06/07/2016 16:23 CDT
Th230	2.67e-02	3.7e-02	6.2e-02	PCI	06/07/2016 16:23 CDT
Th232	6.01e-03	1.3e-02	2.2e-02	PCI	06/07/2016 16:23 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	LCS-00735406D	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013447N
Matrix:	N/A	Assay batch #:	0020924Z
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	LCS
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS108	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	7.62e-03	2.1e-02	4.0e-02	PCI	06/10/2016 15:38 CDT
Th228	3.23e-03	1.4e-02	2.9e-02	PCI	06/10/2016 15:38 CDT
Th230	2.32e+00	2.7e-01	6.0e-02	PCI	06/10/2016 15:38 CDT
Th232	9.68e-03	1.3e-02	1.6e-02	PCI	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG #1600015
SAMPLE ANALYSIS REPORT**

Lab sample #:	RBK-00735405C	Amount analyzed:	1.000e+00 SAMP
Client sample ID:	N/A	Preparation batch #:	0013447N
Matrix:	N/A	Assay batch #:	0020924Z
Collected:	N/A	Prep procedure:	N/A
Sample type:	N/A	Analysis method:	NAREL ACT-02F-TH
Dry/wet weight:	N/A	Analyst:	SPK
Ash/dry weight:	N/A	QC type:	RBK
Sample description:	N/A		
Comment:	N/A		

COUNTING INFORMATION

Date and time	Duration (min)	Detector ID	Operator
06/10/2016 15:38	1000.0	AS109	RCL

ANALYTICAL RESULTS

Analyte	Activity	$\pm 2 \sigma$ Uncertainty	MDC	Unit	Reference Date
Th227	-1.94e-03	1.3e-02	3.6e-02	PCI	06/10/2016 15:38 CDT
Th228	5.48e-03	1.4e-02	2.7e-02	PCI	06/10/2016 15:38 CDT
Th230	9.87e-03	3.2e-02	6.0e-02	PCI	06/10/2016 15:38 CDT
Th232	6.58e-03	1.2e-02	1.6e-02	PCI	06/10/2016 15:38 CDT

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG 1600015
PREPARATION BATCH SUMMARY**

Preparation batch #: 0013438M
 Analysis method: NAREL ACT-02F-TH
 Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	$\pm 2 \sigma$ Uncertainty	Analyst
B6.04113Z	C2-SB2-7284-01	00733660H		77.80 %	7.35 %	SPK
B6.04113Z	C2-SB2-7284-01	00735330A	DUP	84.96 %	7.77 %	SPK
B6.04114A	C2-SB2-7284-02	00733663L		82.92 %	7.69 %	SPK
B6.04115B	C2-SB2-8496-01	00733666P		90.62 %	8.22 %	SPK
B6.04116C	C2-SB3-0012-01	00733669T		85.11 %	7.78 %	SPK
B6.04117D	C2-SB3-1224-01	00733672M		86.68 %	7.94 %	SPK
B6.04118E	C2-SB3-4860-01	00733675Q		83.33 %	7.68 %	SPK
B6.04119F	C2-SB3-6072-01	00733678U		96.53 %	8.49 %	SPK
B6.04120Y	C2-SB3-7284-01	00733681N		92.11 %	8.16 %	SPK
LCS-00735295Q *		00735295Q	LCS	77.40 %	7.41 %	SPK
RBK-00735294P *		00735294P	RBK	76.89 %	7.36 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013438M

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04113Z	00735330A	DUP	TH227		25.8	0.68	PASS
B6.04113Z	00735330A	DUP	TH228		15.3	-1.43	PASS
B6.04113Z	00735330A	DUP	TH230		8.2	0.67	PASS
B6.04113Z	00735330A	DUP	TH232		14.7	-1.34	PASS
LCS-00735295Q	00735295Q	LCS	TH230	95.0		-0.81	PASS
RBK-00735294P	00735294P	RBK	TH227				PASS
RBK-00735294P	00735294P	RBK	TH228				PASS
RBK-00735294P	00735294P	RBK	TH230				PASS
RBK-00735294P	00735294P	RBK	TH232				PASS

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ANALYTICAL RADIATION ENVIRONMENTAL LABORATORY**

**SDG 1600015
PREPARATION BATCH SUMMARY**

Preparation batch #: 0013447N
 Analysis method: NAREL ACT-02F-TH
 Preparation procedure: N/A

NAREL Sample #	Client Sample ID	Analysis #	QC Type	Yield	$\pm 2 \sigma$ Uncertainty	Analyst
B6.04104Y	C2-SB1-0012-01	00735395U		32.30 %	4.57 %	SPK
B6.04104Y	C2-SB1-0012-01	00735404B	DUP	91.23 %	8.09 %	SPK
B6.04105Z	C2-SB1-4860-01	00735396V		87.55 %	7.94 %	SPK
B6.04106A	C2-SB1-6072-01	00735397W		83.13 %	7.83 %	SPK
B6.04107B	C2-SB1-7284-01	00735398X		85.07 %	7.78 %	SPK
B6.04108C	C2-SB1-8496-01	00735399Y		93.56 %	8.30 %	SPK
B6.04109D	C2-SB2-0012-01	00735400X		61.81 %	6.51 %	SPK
B6.04110W	C2-SB2-1224-01	00735401Y		88.83 %	7.94 %	SPK
B6.04111X	C2-SB2-2436-01	00735402Z		87.38 %	8.00 %	SPK
B6.04112Y	C2-SB2-3648-01	00735403A		84.07 %	7.62 %	SPK
LCS-00735406D *		00735406D	LCS	84.44 %	7.70 %	SPK
RBK-00735405C *		00735405C	RBK	84.83 %	7.80 %	SPK

* Samples marked with an asterisk are not in this sample delivery group but were analyzed with it for QC purposes.

QC RESULTS FOR BATCH 0013447N

NAREL Sample #	Analysis #	QC Type	Analyte	%R	RPD	Z	Evaluation
B6.04104Y	00735404B	DUP	TH227		25.3	0.54	PASS
B6.04104Y	00735404B	DUP	TH228		24.2	-1.45	PASS
B6.04104Y	00735404B	DUP	TH230		5.7	0.33	PASS
B6.04104Y	00735404B	DUP	TH232		12.8	0.77	PASS
LCS-00735406D	00735406D	LCS	TH230	115.8		2.32	WARN
RBK-00735405C	00735405C	RBK	TH227				PASS
RBK-00735405C	00735405C	RBK	TH228				PASS
RBK-00735405C	00735405C	RBK	TH230				PASS
RBK-00735405C	00735405C	RBK	TH232				PASS